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Learning to respond: The use of verbal metacommunication as a mathematics teacher educator

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Both as a teacher of mathematics and a new mathematics teacher educator, I have been struck by the importance of verbal metacommunication as a way of responding in discussions about teaching. Having worked on my verbal metacommunication in the classroom for many years as a teacher of mathematics, my attention has now turned to working on verbal metacommunication as a mathematics teacher educator. In this paper, I present an existing framework for some data from discussions with a collaborative group of mathematics teachers that I am working with in a facilitative role. Initial findings suggest the need for the development of a framework more fit for purpose as a facilitator of discussions with groups of teachers.

Mathematics teacher educator learning; verbal metacommunication; facilitator; responding

Background: My classroom context

I started teaching mathematics in secondary classrooms in 2002. The school where I began teaching as a newly qualified teacher was recognised as being innovative in terms of the approach to the curriculum, with year 7 (11-12 years old) and year 8 (12-13 years old) taught in mixed prior attainment groups through a series of what were called “common tasks”, which may be described as projects or rich tasks that students would work on over a series of weeks. One such task for year 8 involved them using matrix multiplication in order to transform shapes on a cartesian plane and then describe the transformation (for example, in terms of a rotation or a reflection). There was a challenge for the students over the weeks of, “given any 2x2 matrix, can you predict the transformation”. Matrices as a topic did not, and still does not, feature on the Key Stage 3 (11-14 years old) or Key Stage 4 (14-16 years old) programme of study, but I saw matrices as a meaningful context through which children could explore transformations at the same time as gaining practice with syllabus items such as plotting coordinates and drawing shapes.

In terms of my classroom, I worked hard to set up a culture, fitting in with the departmental policy, with each class where an overall aim of the year was linked to “being a mathematician”. Over years of teaching the same tasks, I became attuned to hearing comments and observing actions linked to this aim. A powerful tool in culture building was the existence of a commentary from me that went alongside the doing of the mathematics. Examples of these comments in response to student behaviours might have been, “one thing mathematicians do is look for patterns” or “that’s a really lovely example of being systematic”. This way of responding in the classroom is echoed in the words of Pimm (1994) who describes some teaching as being “constantly organized [*sic*] by meta-comments, namely that the utterances made by students are seen as appropriate items for comment themselves” (p. 165). One purpose for commenting

about the students' comments was to create an image of a way of working that supported the students in their approach to working on mathematics, to establish a culture of inquiry, where students were motivated through asking their own questions and working on their own conjectures.

Becoming a mathematics teacher educator

Having moved, almost two years ago, into a teacher educator role, I find myself reflecting on similarities and differences between my previous mathematics classroom and the room where I work alongside a group of pre-service teachers of mathematics. In planning sessions working with pre-service teachers, a useful question for me has been, "What is the purpose of this session, beyond working on the activity itself?" For example, in the summer term, after the group of pre-service teachers have completed their longest school placement, we design a set of sessions around issues that have arisen from their teaching practice. One such issue was framed around building a culture of inquiry. I decided to work with the group on the matrices task (mentioned above). The reason I refer to this particular story here is that it illustrates for me some obvious similarities in teaching students of mathematics and pre-service mathematics teachers. It also illustrates the need for difference, even when running the same task. In reflecting on the matrices session with the group of pre-service teachers, one issue that arose for me was around hearing and responding. Having been attuned to hear and respond to comments in a mathematics classroom, I was able to respond as a teacher but was not quite sure how to respond as a teacher educator. Given the purpose of "creating a culture of inquiry", I had some sense of what the session was about other than just sharing the activity. What I was less confident with was how to respond in-the-moment and what, other than my classroom-attuned responses, I could be meta-commenting upon.

I have also found myself reflecting on my responses when working with post-service teachers of mathematics. I am currently working with a group of secondary school teachers of mathematics who come together to talk about ways of developing the mathematical reasoning of the children in their classrooms. My role in the group is to facilitate a discussion where the teachers talk about what they have been doing in their schools and classrooms related to mathematical reasoning. They share ideas and stories and learn from one another. It is in this setting where I have begun to collect the data that forms the basis of some preliminary analysis later in this paper.

Verbal metacommunication

The term metacommunication was introduced by Ruesch and Bateson (1951), where the concept was developed from detailed study of animal behaviour. Described as "an entirely new order of communication" (p. 209) and defined as "communication about communication" (p. 209), this new order of communication allowed Ruesch & Bateson (1951) to explain some complex and paradoxical attributes of social interaction. Any instance of interpersonal communication will consist of a "report" (p. 179) aspect, synonymous with the content or data of the message, and a "command" (p. 179) aspect, referring to the relationship between the communicants. According to Watzlawick *et al.* (1967), the report aspect of a message conveys information whereas the command aspect concerns how the communication is to be taken and therefore ultimately to the "*relationship between the communicants*" (p. 33). For instance, "you keep interrupting her" and "it is important not to talk over one another" have roughly the same information content (report aspect) but they express very different relationships. It is

the relationship aspect of communication, being a communication about a communication, that is, according to Watzlawick *et al.* (1967), “identical with the concept of metacommunication” (p. 34).

Rossiter (1974) distinguishes between two types of metacommunication: “that which is an ever-present aspect of all transactions and; that which constitutes additional commentary about communicative transactions” (p. 36). The former type consists primarily of non-verbal cues, for example, tone of voice, body language or gesture, which can indicate whether the person communicating is, for example, serious or joking. These metacommunicational cues can provide information about how a message is to be interpreted “by indicating something about intentions and feelings of the message generator” (p. 37). The latter type of metacommunication, which constitutes additional commentary, is the concern of this paper; specifically, my focus is on verbal metacommunication that happens in-the-moment of a discussion.

In terms of verbal communication, metacommunicational clues may be highly ambiguous and can be easily interpreted in entirely different ways. It follows that the ability to metacommunicate appropriately “is not only the condition sine qua non of successful communication, but is intimately linked with the enormous problem of awareness of self and others” (Watzlawick *et al.*, 1967, p. 34). The position, that it is the ability to metacommunicate appropriately that is essential for successful communication, provides a further rationale for my study. In particular, *how* do I use verbal metacommunication when responding to teachers talking about teaching? Furthermore, what is the process of learning to respond in-the-moment in a metacommunicative way?

An existing framework for verbal metacommunication

According to Baltzersen (2008; 2013), a metacommunicative utterance can be analysed according to *all* three of the following basic dimensions: What, how and when do you metacommunicate? He investigated the impact of metacommunication in the supervision process in higher education in Norway through linking survey questions to the “metacommunication concept” (Baltzersen, 2013, p. 128). Though initially methods appear limited in terms of the conceptualisation of this metacommunicational concept (specifically, indicators of metacommunication are linked to: discussing the supervision process and; clarification of tasks and roles in supervisions) his study does suggest that “metacommunication may have a substantial positive effect on the quality of communication in thesis supervision” (p. 130). Based on these findings, Baltzersen goes on to ask the question, “What kind of metacommunication is important to create good supervision in higher education?” (p. 130).

Baltzersen’s (2013) exclusive focus on verbal metacommunication enables him to develop a framework that, though *not exhaustive*, allows review of different definitions and examples of verbal metacommunication used in the supervision process that he was studying. Table 1 (see p. 4), adapted from Baltzersen (2013, pp. 132-134), summarises the framework that stems from two of the three basic dimensions mentioned above: *what* you metacommunicate about and *when* you metacommunicate. The structure of the table is my own creation and consists of a synthesis of Baltzersen’s ideas based on subcategories that he makes in his writing. Under each subcategory, I have extracted associated purposes or functions (column 3) and then the most detailed level (column 4) consists of examples, which I have called actions or exemplifications. I have intentionally not included Baltzersen’s third dimension, *how* you metacommunicate, for which he specifies two subcategories: *monological*

metacommunication (when only one person is metacommunicating) and *dialogical* metacommunication (when all persons in the conversation are metacommunicating) (p. 134). This how dimension is not included as it provides no additional information or detail in terms of purpose/function or action/exemplification. Note, I have coded the table for ease of reference, for example, **A_1** refers to “To talk about intentions”; **A_1_iii** refers to “Disclose own opinion about the conversation” and; **D_iv** refers to “Repeat something said earlier”.

*	Subcategories of *	Purpose/Function	Action/Exemplification
What	Metacommunication about the conversational content (p. 133) A	To talk about intentions 1	Talk about what the <i>listener</i> has said i
			Talk about what the <i>speaker</i> has said ii
			<i>Disclose own opinion</i> about the conversation iii
			<i>Ask for others' opinion</i> about the conversation iv
		To create a working alliance 2	Agree on specific tasks v
			Agree on goals ii
			Identify possible strains in the relationship iii
		To summarise 3	Summarise key points
	Metacommunication about the conversational relationship (pp. 133-134) B	To evaluate some aspect of the relationship between the persons interacting	Explicate disagreement i
			Highlight one's own role or another person's role in the relationship ii
	Metacommunication about the use of conversational time (p. 134) C		
When	As part of the ongoing here-and-now conversation (p. 135) D	To pose clarifying questions	Clarify the speaker's own prior opinion or fact statement i
			Clarify another speaker's opinion ii
			Paraphrase iii
			Repeat something said earlier iv
			Comment on language use v
			Regulate others vi
	Within an extended time-frame (p. 135) E	To establish a working alliance	

Table 1: Framework for analysing verbal metacommunications, adapted from Baltzersen (2013)

* Basic dimension of metacommunication

Having constructed the table somewhat mechanically from the one paper, I offer here some additional thoughts that occurred to me through reflecting. Firstly, on further inspection of **A**, metacommunication about the conversational content, and **B**, metacommunication about the conversational relationship, which Baltzersen (2013) considers sub-categorisations of the “what-dimension” or the “metacommunicative content” (p. 132), I am reminded of the *report* and *command* aspects respectively of interpersonal communication from Ruesch & Bateson (1951). Baltzersen extends his concept of metacommunicational content to incorporate **C**, metacommunication about the use of conversational time, as a further subcategory. This extension suggests a difference in how we might view interpersonal communication as compared to

metacommunicational content. Secondly, the framework is, as intended, for working with students on a one-to-one basis rather than with a group, which might indicate limited suitability as a framework for analysis of metacommunication within conversations between myself and a group of teachers. Many of the actions/exemplifications are certainly imaginable in a group scenario. I will begin to explore some relevance of the framework to my context in the following section.

Analysing an instance of responding in-the-moment

The extract in this section (see Table 2) has been selected from a set of transcribed conversations with the group of mathematics teachers previously mentioned, where my role is as the discussion facilitator. I have been audio recording these conversations (of which there have, so far, been four) over the last year and each conversation has tended to last for around an hour. The extract below is from the second reflective discussion of the group, which took place in our third meeting together. From the perspective of learning to respond effectively as a facilitator and having transcribed the full discussion, I began by identifying my turns (coded with a T in the transcripts) in the discussion, looking also at what was said just before my turn (for context) and just after my turn (to gauge any immediate reaction). The extract below (Table 2) is one such turn. Note that X4 denotes one of the teachers from the group.

An interesting dilemma to begin with is whether an utterance automatically qualifies as a metacommunicative utterance if it corresponds to one of the Baltzersen's actions/exemplifications (see Table 1) or whether more conditions must be satisfied. In other words, is "paraphrasing", for example, always metacommunicative? Another way of considering this is to ask what other actions/exemplifications are forms of metacommunicative utterance that are relevant in my context that are not included in the Baltzersen framework. For utterances not included, I would need some way of establishing what, in principle, qualifies as metacommunicative so that further actions and exemplifications may be established.

X4	Um, yeah, from what I thought would be kind of do and review of something at quite a low level and I'd have to really go over here's how you do area, here's how you do perimeter, actually it then turned into they did it all themselves, and you know in the class you get hands up all the time, it was wasn't sir help me, it was sir look at this, look at this, look at this I did it
T	Oh, that's nice, so the difference was in hands
X4	Yeah
T	The reason for the hands going up was very different
X4	I found it!

Table 2: Extract from transcribed conversation

So, I begin by considering whether "Oh, that's nice, so the difference was in hands" (from Table 2 above) qualifies as metacommunication, or, in other words, is the utterance a communication *about* a communication? One difficulty here is possibly with the word *about* which needs further clarification. "Oh, that's nice" is ambiguous in that the use of "that" makes it difficult to evaluate what it is that is labelled "nice". However, the second part of the utterance, "so the difference was in hands" offers an indication as to what I was valuing in that moment, using "so" as the link would suggest the "nice" was in recognition of the previous speaker's acknowledgement of an observed difference, in this case, a different reason for hands going up. Is this communication *about* communication? Having made the comment myself, I do of

course have an insider perspective. One awareness, that I know I have, is when a teacher talks about a change in their behaviour or that of their students. When this happens, I find myself wanting to highlight that a difference has been noticed and how this difference has been observed. One purpose of doing this is to direct the attention of others; to invite others to consider differences in their own classrooms and; to emphasise the importance of these types of observations as a classroom teacher working on their teaching. I suppose on one level, the utterance, “Oh, that’s nice, so the difference was in hands”, could be categorised according to my adapted Baltzersen framework (see Table 1) as “repeating something said earlier” (**D_iv**) or “paraphrasing” (**D_iii**). Given the added dimension of self-scrutiny, these categories do not quite fit.

Going forward: Implication for future study

Having adapted a framework from Baltzersen (2013) for analysing metacommunicative utterances (see Table 1) and considering this framework in light of only one response from one conversation with a group of post-service teachers of mathematics, I am encouraged to continue the process of analysing my responses in this detailed way. Primarily, my need comes from learning how to respond as a mathematics teacher educator working with groups of teachers. What has also become apparent is the need for a more developed framework for analysing metacommunication and the use of this as a facilitator of discussions between teachers who are themselves learning. An important contribution to the field of mathematics education and, in particular, to mathematics teacher education and teacher educator learning would be a framework for categorising effective metacommunicative responses in working with teachers of mathematics in a facilitating role.

In the process of creating a framework for metacommunicative responses, through paying attention to how I respond in-the-moment and by analysing these responses in detail, I aim to track any shift in behaviour in terms of my own communications in future group discussions. One imaginable route is for me to explore how my responses, at a metacommunicative level, influence the responses of the teachers, so that I can learn how it is possible to support future groups.

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